2nd NREL Wind Energy Systems Engineering Workshop Agenda

Overview

The 2nd NREL Wind Energy Systems Engineering Workshop will take place on the 29th and 30th of January 2013. The first workshop in January 2010 was a success in catalyzing interest in this important topic among participants from industry, the national laboratories and academia. In the last few years, the interest in systems engineering and techno-economic modeling of wind energy systems has grown substantially. At this 2 day workshop, we will showcase research and development activity in these areas and provide plenty of opportunity for discussion about potential future developments and collaborations. Follow-on meetings on the 31st of January and 1st of February will feature software tutorials smaller group meetings for discussion.

Tuesday, January, 29, 2013 (Renaissance Hotel)	
11:00 am to 1:00 pm	Registration Open
1:00 pm to 1:45 pm	Day 1 Opening remarks: **Mr. Nick Johnson, DOE Energy Efficiency and Renewable Energy** Opening Keynote Address: "System innovation in wind energy" **Dr. Paul Veers, NREL National Wind Technology Center**
1:45 pm to 2:00 pm	Break
2:00 pm to 3:00 pm	Session I: Wind Energy System Costs from Turbines to Plants **Moderator: Mr. Ben Maples, NREL National Wind Technology Center** **Dr. Eric Lantz, NREL Strategic Energy and Analysis Center** **Ir. Bernard Bulder, ECN, the Netherlands** **Mr. Rajan Arora, RES Americas**
3:00 pm to 4:00 pm	Session II: Systems Engineering Methods Applied to Wind Energy I **Moderator: Dr. Rick Damiani, NREL National Wind Technology Center** **Dr. Carlo Bottasso, Politecnico di Milano, Italy** **Dr. Andrew Ning, NREL National Wind Technology Center** **Dr. Ryan Schkoda, Clemson Wind Turbine Drivetrain Testing Facility**
4:00 pm to 4:15 pm	Break
4:15 pm to 5:15 pm	Session III: Systems Engineering Methods Applied to Wind Energy II **Moderator: Mr. Scott Hughes, NREL National Wind Technology Center** **Dr. Joaquim Martins, University of Michigan** **Dr. Curran Crawford, University of Victoria, Canada** **Dr. Turaj Ashuri, University of Michigan**
5:15 pm to 5:30 pm	Break
5:30 pm to 7:30 pm	**Evening Reception and Poster Session** Please email abstracts to Katherine Dykes at katherine.dykes@nrel.gov

Wednesday, January 30th, 2013 (Renaissance Hotel)	
8:00 am to 8:30 am	Registration and Continental Breakfast
8:30 am to 9:45 am	Day 2 Opening Remarks: **Dr. Maureen Hand, NREL Strategic Energy and Analysis Center** Opening Keynote Address: Reducing the cost of wind energy **Dr. Henk-Jan Kooijman, GE Energy**
9:45 am to 10 am	Break
10:00 am to 11:00 am	Session IV: Systems Engineering Methods Applied to Wind Energy III **Moderator: Mr. Justin Gray, NASA** **Dr. Juan Alonso, Stanford University** **Dr. Gianluca Iaccarino, Stanford University** **Dr. Mike Eldred, Sandia National Laboratories**
11:00 am to 12:30 pm	Session V: Systems Engineering Application to Industry Wind Turbine Design **Moderator: Dr. Scott Schreck, NREL National Wind Technology Center** **Dr. Chris Halse, Romax Technology** **Dr. Eddie Mayda, Siemens Energy Inc.** **Mr. John Leahey, Vestas – American Wind Technology, Inc.** **Mr. Pat Riley, GE Global Research**
12:30 pm to 2:00 pm	Lunch Keynote Address: "Offshore energy system design" **Mr. Jim O'Sullivan, Technip**
2:00 pm to 2:15 pm	Break
2:15 pm to 3:15 pm	Session VI: Wind Plant Design and Optimization I **Moderator: Dr. Pat Moriarty, NREL National Wind Technology Center** **Mr. Philippe Giguere, GE Energy** **Dr. Matt Churchfield, NREL National Wind Technology Center** **Mr. Jake Frye, DNV KEMA Energy & Sustainability**
3:15 pm to 3:30 pm	Break
3:30 pm to 4:30 pm	Session VII: Wind Plant Design and Optimization II **Moderator: Dr. Pat Moriarty, NREL National Wind Technology Center** **Mr. Matt Filippelli, AWS Truepower** **Mr. Scott Haynes, Iberdrola Renewables** **Mr. Matthew Lynn, GL Garrad Hassan**
4:30 pm to 5:30 pm	Session VIII: Integrated Wind Turbine and Plant Modeling **Moderator: Dr. Peter Graf, NREL Computational Sciences Center** **Ms. Katherine Dykes, NREL National Wind Technology Center** **Dr. Frederik Zahle, DTU Wind Energy, Denmark** **Dr. Pierre-Elouan Réthoré, DTU Wind Energy, Denmark**
5:30 pm to 5:45 pm	Closing Remarks **Dr. Fort Felker, NREL National Wind Technology Center**

Workshop Follow-On Meetings Agenda

Thursday, January 31st, 2013 (At NREL NWTC)	
8:00 am to 12:00 pm	**DAKOTA Tutorial: Basics** In this introduction to DAKOTA, we will tour DAKOTA's capabilities and learn how to create simple DAKOTA studies. Format will be mixed lecture and demonstration including: ➢ DAKOTA Overview: orientation, how to get started, JAGUAR DAKOTA GUI, workflows. ➢ Sensitivity Analysis: identifying the most important input factors. ➢ Uncertainty Quantification: performing statistical analysis of response quantities. ➢ Optimization: finding the best designs. ➢ Calibration: using data to estimate model parameters.
12:00 pm to 1:00 pm	**NREL NWTC Tour** Walking tour of the NREL NWTC facilities.
1:00 pm to 5:00 pm	**OpenMDAO Tutorial: Basics** The OpenMDAO Training session will cover installation, basic component definitions, GUI usage, MetaModeling and Optimization Processes.
Friday, February 1st, 2013 (At NREL NWTC)	
8:00 am to 10:00 am	**Working Group Session on Standard Software Interfaces for OpenMDAO Wind Applications** The NREL NTWC and DTU-Wind are working together to establish a unified framework for interoperability of wind turbine and plant software in OpenMDAO. This workgroup will discuss the status of the framework development and seek to engage other parties to join in the framework development process.
10:00 am to 1:00 pm	**DAKOTA Tutorial: Advanced Topics** In this follow-on DAKOTA tutorial, we will tour more advanced DAKOTA capabilities and learn how to interface with engineering simulations. Format will be mixed lecture and demonstration. Modules will include: ➢ Simulation interfacing: an introduction to interfacing DAKOTA to your model. ➢ Parallel computing: asynchronous local, MPI, and hybrid modes. ➢ Multi-component studies with multiple methods and models. ➢ Other research topics of interest: e.g., surrogate-based and adaptive methods.
10:00 am to 12:00 pm	**Working Group Session Review of NREL Wind Models** Over the last few years NREL has been involved with the development of several new models for wind energy applications from physics to cost; we invite participants to an interactive review session on these models.
1:00 pm to 3:00 pm	**NREL TWISTER Tutorial: Demonstration and Tutorial** This tutorial is a mixed lecture and interactive demonstration of the new NREL TWISTER model for wind plant systems engineering. NREL seeks to establish a Beta-user community for the new integrated software tool.
3:00 pm to 5:00 pm	**FAST Modularization Framework Presentation** Presentation on the new FAST modularization framework and programming guidelines.